one of the work-tables is twenty-five kronen. This includes the necessary reagents, the free use of all the apparatus and the museum, also the use of the boat, with the men, for private explorations, and liberty to take part in the weekly steamer excursions to the distant parts of the fjords.

The institution is open every day all the year round; the fjords are never quite frozen, and at the coldest time the temperature is never more than a few degrees from zero.

The institution is under the supervision of Herren Dr. A. Appellöf, G. A. Hansen, and T. Brunchorst. It is almost entirely supported by voluntary contributions. A certain sum, however, is granted by the State, which unfortunately is not sufficient to permit the institution to have a resident zoologist; but as the Norwegian Government is always so liberal in matters of a scientific nature, it is hoped that the required amount will soon be granted.

PROFESSOR DR. FISCHER.

BY the death of Prof. Dr. Fischer, which took place on May 17 last, the Königliche Preussische Geodätische Institut and the Central-bureau der Internationalen Erdmessung lose a very ardent and devoted chief who has done much, not only to keep up the high standard of these institutions, but to bring them, if possible, to a higher grade of perfection.

Born in the year 1836, on December 10, at Deutsch-Leippe, near Grottkau, in Schlesien, Amand Fischer began his first studies at the Mathias-Gymnasium in Breslau, occupying his attention, among other things, with mathematics and science (*Astr. Nach.* Bd. 135, No 3235); he graduated in 1866, the subject of his dissertation being the Comet III. of 1860. In the following year he entered in the Central-bureau der Mitteleuropäischen Gradmessung, and two years later in the Königliche Preussische Geodätische Institut, in which he commenced his great activity, which he continued up to the end. From July 1877 he conducted the sections relating to Geodesy.

Among the numerous valuable works brought before the public will be remembered the "Rheinische Dreiecksnetz," in which were a great number of Fischer's measurements, made at the majority of the stations employed. He found occasion also to busy himself with lateral refraction, and he made an interesting contribution on "Lothabweichungen in der Umgebung von Berlin" (1889), which was valuable in the discussion regarding the relation between Geodesy and Geology.

At a somewhat earlier date, in an article that appeared in the *Astr. Nach.* (Bd. 88), entitled "Die Gestalt der Erde und die Pendelmessungen," he brought forward the interesting deduction that the variation, which Ph. Fischer had calculated from the measures of gravity, could be traced back to geological causes, a deduction which agrees very nearly with our present ideas.

The publication of the "Berliner Basisnetzes" (1891) absorbed a great amount of his activity, as he paid special attention to this piece of work. In the measurements made in the Strehlen, Berlin, and Bonn base-lines operations, he took, finally in the capacity of director, a prominent part. We have to thank him, also, for some important thermoelectrical researches on the expansion of the rods used for base-line determinations. (*Astr. Nach.* Bd. 103.) He determined, also, the difference of longitude between Wangeroog and Schillig by means of optical signals, during the time of the operations on the trigonometrical survey of the North Sea islands and the mainland, with the computation of which he busied himself.

We are indebted to him for a great number of astronomical observations made at several stations for the trigonometrical work in which he was employed.

In order to get some idea of his dexterity and care, and more especially of his love for work and his self-sacrifice, one must not only look at the literary side of Fischer's activity, but at that in which his capacity as an observer was a very prominent feature.

Besides a host of numerous friends who mourn his loss, he leaves behind a widow and three children.

NOTES.

THE subjects for 1895 for the results of original research, upon which the Royal Society of New South Wales offer their medal and £25, are as follows:—(1) On the Silver Ore Deposits of New South Wales. (2) On the Physiological Action of the Poison of any Australian Snake, Spider, or Tick. (3) On the Chemistry of the Australian Gums and Resins. The communications are to be sent in not later than May 1, 1895. The subjects for 1896 are also announced as follows:—(1) On the Origin of Multiple Hydatids in Man. (2) On the Occurrence of Precious Stones in New South Wales, with a description of the deposits in which they are found. (3) On the Effect of the Australian Climate on the Physical Development of the Australian-born Population. The Society emphasise the condition that the award will not be made for a mere compilation, however meritorious it may be.

THE Council of the Royal Society of New South Wales have awarded the prize given by the Hon. Ralph Abercrombie for the best essay on "Southerly Bursters" on the east coast of Australia, to Mr. Henry A. Hunt, second meteorological assistant in the observatory at Sydney. The essay contains the results obtained from a study of all the bursters that visited the east coast from 1863 to 1893, and is illustrated by weather charts, cloud photographs, and diagrams showing the monthly and hourly distribution of these wind storms, as well as diagrams showing instrumental conditions in typical cases.

MANUSCRIPTS competing for the De Candolle Prize for 1895, offered by the Geneva Physical and Natural History Society, for the best unpublished monograph of a genus or family of plants, must be sent in by January 15, 1895. They may be written in Latin, French, German, English, or Italian. The value of the prize is 500 francs.

LIVERPOOL is fortunate in having citizens who testify their interest in the scientific welfare of the city by munificent generosity. We have previously noted the endowments, by the Earl of Derby and Mr. George Holt, of chairs in anatomy and pathology at the University College, Liverpool. We now learn, from the *British Medical Journal*, that the Rev. S. A. Thompson Yates has presented the College with the sum of £15,000 in order to build physiological and pathological laboratories.

THE Danish Government has undertaken, during the years 1895 and 1896, a deep-sea exploration in the Greenland and Icelandic waters. The expedition will be accompanied by a botanist.

ONE of the last acts of the late President Carnot, a few hours before his assassination, was to confer on the well-known botanist Dr. Saint-Lager the dignity of Officer of Public Instruction.

DR. V. SCHIFFNER has sent to the Botanical Institute of the German University of Prag a very large collection of dried plants and spirit-material from Western Java. He is intending also to visit Eastern Java and Sumatra.

THE antiquities, ranging from prehistoric down to Roman times, lately discovered by Prof. Flinders Petrie in the temple of Koptos in Upper Egypt, will be exhibited to the public in the Edwards Library, University College, Gower Street, from July 23 to September 1.

The death is announced of Dr. Adolph Hannover, at Copenhagen, at eighty years of age, and of Dr. J. Hyrtl, of Vienna University, at the age of eighty-four.

The first annual meeting of the Australasian Institute of Mining Engineers, recently held at Ballarat, Victoria, appears to have been a very successful one. The inaugural meeting of the Institute was held last year at Adelaide, when Sir Henry Ayres, the President of the Legislative Council of South Australia, was chosen as its first president. Among the speeches delivered at that time was a very pointed one by the Hon. James Martin, the head of the engineering firm bearing that name. In the course of his remarks he said: "Science is much needed in mining, for without it mining cannot go along. We have been blundering too much by rule of thumb, which has done much to injure the mining industry and those who are willing to take some risks in mining. It has been the want of knowledge of the men who have been placed as mining managers that has ruined so many concerns. We want to bring science, experience, and knowledge to bear upon mining, so that we will be able to bring wealth from the earth without a waste of labour." Mr. James Stirling, the present president of the Institute, took the "Mineral Wealth of the Colony of Victoria" as the subject of his address at the Ballarat meeting. A variety of papers on mining topics were read and discussed, and visits were made to a number of mines and engineering works. The Institute has accepted an invitation from the Premier of Tasmania to hold the annual meeting in Hobart, Tasmania, next year, at which time the mining exhibition will be open.

Under the conductorship of Major Lamorock Flower, a meeting of the Essex Field Club was held last Saturday on the River Lea, the Conservancy Board having placed their steam-barge at the disposal of the club for the occasion. About sixty members embarked at Hertford and steamed down the river as far as Tottenham. Many well-known scientific men were present and gave addresses during the course of the day. Major Flower, after welcoming the party on behalf of the Conservancy Board (to which he is sanitary engineer), gave an account of the river and of his own work in connection with the improvement in its condition. After lunch at Broxbourne, Mr. J. E. Harting read a short paper on Izaak Walton's association with the river, and exhibited a most interesting set of prints in illustration of his remarks. Mr. G. J. Symons, F.R.S., later in the day, gave an account of the watershed, and explained the connection between the rainfall and the water supplied to the river. Mr. Howard Saunders followed with an address on the birds of the Lea Valley, and Mr. T. V. Holmes concluded with a paper on the geology of the district, explaining how the river had in the course of time shifted its bed generally in an easterly direction, leaving gravel deposits to the west often a mile or more from the present stream. As the result of a most enjoyable meeting, it was generally conceded that the river above the intake of the East London Waterworks Company at Ponder's End was in a very good condition, but great regret was expressed at the accumulation of heaps of the most evil-smelling garbage which here and there greeted the party on their way down. This refuse, as Major Flower explained, is brought from London in barges, and is heaped by the river banks under certain legal powers permitted by an Act of Parliament passed in 1868, and which the Conservancy Board has therefore at present no power of preventing; but it is to be hoped that the general advance of sanitary science will soon be such that public opinion will lead to legal restrictions as to the placing of decomposing refuse on the banks of any stream of which the water is used for human consumption.

According to press telegrams, the cholera epidemic which has recently appeared at St. Petersburg is assuming an alarming character, being much more severe than that of last year. It is officially reported that 875 cases of cholera, and 294 deaths have occurred in St. Petersburg alone from the 8th inst. up to Saturday last. In Cronstadt, also, the disease has become epidemic, and other parts of Russia are seriously affected. A number of deaths from cholera are reported from the province of Galicia, in Austria-Hungary. Zaleszczki, in Galicia, has been declared to be a centre of the epidemic, and the necessary precautions have been taken to prevent communication with the infected district. Cases of cholera have also occurred in Sparta, near Adalia, Asia Minor, in the Prussian part of the Vistula, and at Liège and several surrounding villages, and an isolated case with choleraic symptoms has been notified at Paris.

Further particulars with regard to the earthquake in Turkey last week show that it was of a very serious nature. No official return of the real number of victims has yet been published, but Reuter reports that the death-roll in Stamboul alone is known to exceed two hundred. According to Press telegrams, the damage to property in Constantinople is estimated to amount to £T6,000,000. There is scarcely a street in that city which does not show signs of the destructive effects of the earthquake, many of the old Turkish houses in Stamboul and the suburbs having been completely wrecked. The Grand Bazaar suffered severely. The vaulted roof of the jewellers' arcade fell in, causing a scene of great panic and confusion. Reuter's telegrams state that, at Prinkipo, the Greek Orthodox Church and a large number of houses were destroyed or seriously damaged. On the island of Halki nearly all the houses have been rendered uninhabitable. A portion of the Great Ottoman Naval College also collapsed, six students being killed and several injured. On the island of Antigoni not a house has been left intact, with the exception of the monasteries. At Pera four houses fell in, and many were damaged, the number of victims being five. The village of Galateria, near St. Stephano, has been completely destroyed. The shock was felt in the interior of Anatolia at a distance of 236 miles from Constantinople. Nearly all the railway stations have been damaged, and the town of Jalova, in the Gulf of Ismidt, has been almost totally destroyed. During the first shock at the island of Halki and the village of St. Stephano the sea retired over 200 yards, leaving many boats and vessels high and dry. The waters then returned with such force and violence that they overflowed the quay, hurling the boats on to the shore far above sea-level, and causing great damage. It is reported that shocks continue to be felt at intervals, but the movements of the ground are barely perceptible. The point from which the surface disturbances proceeded is said to be in the Sea of Marmora, somewhere between Jolava on the Asiatic side, and Stephano on the European side.

A private telegram to the Royal Geographical Society has brought bad news of the Wellman polar expedition, the departure of which for Spitzbergen was noticed in Nature, vol. l. p. 57. The steam-yacht *Saide*, belonging to Captain Townley-Parker, of the Royal Yacht Squadron, called at Danes Island, in the north-east of Spitzbergen, on July 6, and found the geologist of Mr. Wellman's party, Mr. Oyen, alone in charge of the house and stores. The expedition had reached Danes Island safely on May 7, and after landing Mr. Oyen, set out for Seven Islands on the 10th, promising to send back the steamer for Mr. Oyen in a week's time; but she had never returned. The *Saide* at once attempted to go in search of the missing vessel, but was stopped by ice off Hakluyts Head in 80° 10' N., and compelled to return. No trace of the ship had been seen by the Norwegian walrus-hunters who are cruising off Spitzbergen, and the inevitable conclusion is that she has been beset by the ice and probably foundered. It is hoped that Mr. Wellman and his party of fifteen men had left the vessel and started on their northward journey before this happened; and if that be so, there is no reason why they should not return safely to Danes Island. Spitzbergen is now visited so frequently during the summer months, that little anxiety need be felt as to their return to civilisation should they be able to regain the island; but since the provisions in store are only sufficient to supply eight men for six months, it is important that additional supplies should be sent to provide for emergencies.

WE have received from Prof. Guido Cora a copy of a short paper communicated by him to the Italian Geographical Congress of 1892, in which he strongly urges the importance of a more complete and detailed study of the minute geography of Italy, proposing the formation of a special committee to elaborate and carry out the scheme. It is a subject no less pressing in England than in Italy, for to a properly qualified geographer there is no part of the world riper for investigation and more deserving of study than those countries of Europe in which the ground for a solid constructive geography has been laid by complete topographical and geological surveys.

THE State of Minas Geraes in Brazil has recently established a Geographical and Geological Commission, entrusted with the rectification of the topographical map and with the geological survey of the State. The first *Boletim* of this Commission has just been published at Rio de Janeiro by Señor A. de Abreu Lacerda, chief engineer. It contains an account of the objects of the Commission, which are to delimit the State and lay down the boundaries of the subordinate political divisions, to determine the nature of the rocks, minerals, and cultivable soils, to fix the altitudes of important places, and to make a triangulation of the State. The work is modelled on that of the United States Coast and Geodetic and Geological Surveys, and there are several Americans engaged on the operations.

THE lectures to intending travellers on various aspects of science, given at the Natural History Museum in Paris, continue, and are reported fully in the *Revue Scientifique*. The most recent were on Palæontology, by M. Marcellin Boule, and on "Metrophotography" by M. Laussedat. The latter is particularly interesting, and shows that the use of photography in surveying is a natural development of a method which Beautemps-Beaupré introduced more than fifty years ago. He utilised panoramas sketched by means of a camera lucida at opposite ends of a measured base-line, and by an ingenious arrangement of the two views on a plane-table plotted the map without any calculations. In this method photography simply facilitates the production of the pictures, the rest of the process remaining the same. The calculation of vertical heights from the photographs is simple when the correct relative distances of the objects are laid down on a map, and thus the simple operation of taking a photograph of the same object from two points suffices for the construction at any future time of a contoured map.

FROM a circular received from Prof. Dr. Coloman Müller, we note that the preliminary arrangements of the Eighth International Congress of Hygiene and Demography, to be held at Budapest from September 1 to 9, 1894, are nearly completed. The Congress promises not only to be a worthy successor of its predecessors, but also to be in some respects superior to them. Up to the present time a total of 725 papers have been notified, of which 593 belong to the Hygienic, and 132 to the Demographic groups of the Congress. Besides this, 26 Governments with 92 delegates, 91 Public Corporations with 163 delegates, 41 Universities with 65 delegates, and last, but not least, 132 learned Societies with 300 delegates, have expressed their intention of being represented at the Congress. The following are among the subjects of promised communications:—Mr. Ernest Hart, on protection against cholera in the Orient, and the hypothesis of its epidemic diffusion; Prof. Dr. E. Leyden (Berlin), on provisions made by large towns for consumptives; Prof. Dr. George Mayr (Strassburg), on statistics and social science; Baurath Herzberg, C.E. (Berlin), the civil engineer's work in hygiene; Prof. E. Levasseur (Paris), the history of Demography; Prof. Dr. E. T. Erisman (Moscow), the struggle with death; Prof. Dr. C. Lombroso (Turin), the criminal.

THE Congress of the British Institute of Public Health, to be held in London from July 25 to 31, under the presidency of Prof. W. R. Smith, promises to be an important one. About 1500 delegates have already been appointed, and if two-thirds of the number attend the meetings the organisers at King's College will have a difficulty in accommodating them. The Congress will be divided into five sections as follows:—(A) Preventive Medicine; (B) Chemistry and Climatology; (C) Municipal and Parliamentary; (D) Engineering and Building Construction; (E) Naval and Military Hygiene. Among the subjects which will be brought up for discussion in the first section are:—The mode of spread and methods of prevention of diphtheria; the dissemination of disease by river-water; the self-purification of rivers; and the alleged aërial diffusion of smallpox. In the second section the subjects for discussion include the chemical and bacteriological examination of water; the purification of sewage; and the micro-organisms in sewer air. In Section D discussions have been arranged on electric lighting from the point of view of public health; on a system of softening public water supplies; sewage disposal; and other matters. There will be conferences on "The Housing of the Working Classes" and "The Provision of Isolation Hospitals," and on Saturday, the 28th inst., Prof. E. M. Crookshank will deliver a popular lecture on "Microbes and the Spread of Infectious Diseases." A number of visits will be made to places and institutions of interest from a public health point of view.

IN a memorandum on the mitigation and prevention of insect ravages in India, forwarded a short time ago to the Department of Revenue and Agriculture of the Government of India, the Hon. J. Buckingham, C.I.E., pointed out the necessity for a staff of entomologists, and suggested a scheme for the organisation of an entomological department. Though crops to the value of millions of rupees are destroyed annually in India by insect-pests, the Government had not until recently seriously set to work to modify these ravages. In the United States, as also in Canada and parts of Australia, the Government has taken up the matter, with the result of the introduction of new methods of treatment which in some cases have effected an enormous saving. The memorandum calls attention to the fact that in the United States, besides entomological advisers attached to individual States, a strong section of entomology is kept up as a branch of the Agricultural Department of the Central Government. Attached to the entomological section are some fourteen trained entomologists, who visit all parts of the country in order to study and report upon destructive insects. The great importance of collecting information personally upon the spot is so fully recognised that the travels of the investigators are not confined to the limits of the United States, but representatives are even occasionally despatched to distant parts of the world. At the time when the memorandum was drawn up, however, all that had been done was to empower one of the officers of the Indian Museum in Calcutta to report upon insects which were submitted by planters, officials, and others, and to publish the results. Doubtless in this way a considerable amount of information has been collected, and the nature of a large number of the more destructive species of blights have been ascertained; but, as the memorandum urged, what was wanted was a specialist free to move about the country, and supported by laboratory assistants in some fixed place. To render the work of practical value, it is essential that it should be carried on continuously from year to year, so that the observations made in one season may be supplemented and verified by those made in the next, and that a record may be kept up of the increase or decrease of particular blights, so that the planting and agricultural community may be warned in time of impending danger. For the sake of Indian agriculture, we are glad to see that the scheme put forward by the Hon. J. Buckingham has been favourably considered. The Government of India has expressed a readiness to appoint two or three entomologists for the benefit of agriculturists throughout the country. It is not, of course, supposed that the appointment of this small staff of entomologists will result in the suppression of every destructive insect; but there can be no doubt that careful local investigations would, in many cases, lead to the development of improved methods of fighting the evil. In connection with the subject of the memorandum, it is worth remark that the Planters' Association of Ceylon have recently made the modest request for one entomologist to study the insects which attack tea and other plants under cultivation there. Dr. Trimen, of the Royal Botanic Gardens, Peradeniya, has, however, informed the Colonial Secretary at Colombo that, while he would support the appointment of an entomological assistant for the Colombo Museum, who would pay special attention to injurious insects, he could not recommend the appointment of an entomologist for the agricultural community alone. Mr. A. Haly, the Director of the Museum, also thinks that a special officer is not needed for the small area covered by Ceylon, and suggests that the case would be fully met by the appointment of an entomological referee.

THE *Illini* informs us of the establishment on the Illinois River, at Havana, of a biological station devoted to the systematic and continuous investigation of the plant and animal life of the waters of that region. This establishment, authorised by the trustees of the University in March, is under the direction of Prof. S. A. Forbes, with Mr. Frank Smith in immediate charge of the work. The field work is done from a cabin boat, chartered for the summer, which carries the seines, dredges, surface nets, plankton apparatus, and other collecting equipment, together with microscopes, reagents for the preservation of specimens, a small working library, a number of special breeding cages for aquatic insects, and a few aquaria. This boat is provided with sleeping accommodation for four men, and with a well-furnished kitchen. In Havana itself are office and laboratory rooms supplied with running water and electric light, and provided with the usual equipment of a biological laboratory, consisting of first-class microscopes, microtomes, biological reagents, &c., and tables for five assistants. The boat is established in Quiver Lake, an elongated bay of the Illinois, two and a half miles above Havana. From the lake and the river, selection has been made of a number of typical situations, and from these, and from Phelps and Thompson lakes, a little distance away, collections of all descriptions are made at regular intervals for a comparative study of the organic life—the relative abundance of the species at different seasons of the year, and the general system of conditions by which it is affected. We understand that this is the first inland aquatic biological station in America manned and equipped for continuous investigation; and the first in the world to undertake the serious study of the biology of a river system.

WE learn from the *Lancet* that an admirably appointed biological station, modelled upon that at Naples, has just been opened at Dröbatt, on the Christiania Fiord, not far from Christiania. It is said that the international element so wisely encouraged in the Neapolitan institution, by which, in return for an annual subsidy, the universities of the world are entitled to avail themselves of its facilities, will also be recognised at the Norwegian station.

THE report for 1893 of Dr. S. Schönland, the Curator of the Albany Museum, Grahamstown, to the Committee of the museum, has been issued. We learn from it that the institution has largely increased in popularity, the number of visitors having been over 22,000, or more than 2000 in excess of those of 1892. Its value as an educational institution has also been widely appreciated. The Committee dwells on the necessity of the appointment of an assistant who would take over the Entomological Department, the work having become too great for the Curator. It is also urged that, as the grant hitherto accorded to the institution by Parliament is insufficient, even with the greatest economy, to meet urgent requirements, a suitable increase will be made. As many as 7660 specimens were added to the collection in the museum during 1893, all of them being of South African origin.

THE changes of plumage in the Red Grouse (*Lagopus mutus*) have long attracted the attention of ornithologists. Mr. W. R. Ogilvie-Grant gives, in *The Annals of Scottish Natural History* for July, an interesting account of these changes, the nature of which he has described in vol. xxii. of the Catalogue of the birds in the British Museum. In that publication it was conclusively shown that both the male and female of the Red Grouse have two distinct moults during the year, but whereas in the male they occur in autumn and winter, in the female they take place in spring and autumn; the former having no distinct spring, and the latter no distinct winter, plumage. These seasonal variations are clearly explained in the paper referred to, and the principal changes, moults, and varieties are illustrated in two beautifully coloured plates, the feathers of each sex being shown separately.

DR. R. HANITSCH, of Liverpool, has done a most useful and, we need scarcely say, laborious piece of work in his revision of the generic nomenclature and classification in Bowerbank's "British Spongiadæ" (Trans. Liv. Biol. Soc., viii. 1894, pp. 173–206). His paper consists of two parts, dealing with the nomenclature and classification respectively. In the first section are given parallel columns of Bowerbank's and the revised nomenclature; and in the second a list of the British sponges described by Bowerbank, classified in accordance with recent research. Definitions of all British genera of Monaxonida are given. *Lissomyxilla*, for the reception of Bowerbank's *Tethea spinosa*, is new. For the most part, however, the author's arrangement is compiled from the revisions and work of Ridley and Dendy, Sollas, Topsent, Von Lendenfeld and Vosmaer.

A NEW form of phonograph of a particularly simple construction has been described before the Electro-chemical Society of Berlin by Herr A. Kœltzow. In this instrument, which in consideration of its low price appears suited to many purposes, at any rate in those countries where patent rights will not prevent its introduction, the cylinder on which the record is made is composed of a hard kind of soap. Each cylinder, which costs about three shillings, admits of being used for recording 250,000 words, since an arrangement allows of the removal of a very thin layer from the surface when this has been covered. Thus the cost of the cylinders for registering any number of words is not more than the cost of the paper which would be required if they were written down.

THE village of Gossau, situated about ten kilometres from St. Gall in Switzerland, was recently the scene of a curious electrical phenomenon. This village is lighted by a supply station situated at a distance of twelve kilometres, which supplies the current at high tension to transformers at the village. During a thunderstorm, which lasted several hours, the supply wires were struck by lightning, all the electric lamps being extinguished, while bright sparks passing between the aërial wires lighted up the whole village. These phenomena were particularly brilliant at the chief transformer sub-station, where the sparks continued to pass for more than an hour, and only stopped when the circuit was broken at the generator station.

THE current number of *Science Progress* contains a paper by Mr. Chree, the Superintendent of the Kew Observatory. In this paper, which is entitled "The most recent Values of the Magnetic Elements at the Principal Magnetic Observatories of the World," the author points out the importance of the continuous records of the different magnetic elements made at some of the observatories, both for the purpose of applying the correction for secular change to the charts and maps used by travellers by land and sea, and for allowing observers engaged on a magnetic survey to correct their observed results by allowing for any disturbance of the observed element from its mean value at the moment at which the observation was made. The possibility of making this correction depends on the fact that the diurnal change as well as the small irregular disturbances occur simultaneously, and similarly over considerable tracts of country. This fact is very markedly shown by superposing the photographic traces obtained at Kew and Falmouth, when it will be found that every little undulation is faithfully reproduced. The paper also contains a "popular" account of the different observations made, and the methods by which the photographic curves are obtained and the results reduced. A most useful table of the magnetic elements at the different observatories, which we see from an editorial note is to be continued from year to year, is appended. This table contains besides the latitude and longitude of the observatory, the mean declination, dip, horizontal force and vertical force for the last year for which data are available. A very useful addition to the table would be four additional columns giving, where possible, the secular change.

WE have received from T. Homén, of the University of Helsingfors, a work entitled *Bodenphysikalische und meteorologische Beobachtungen*, which has been carefully compiled from all available sources, and also from a long series of observations made by the author, with especial reference to night frosts and their effect upon vegetation in the spring and autumn. The observations and conclusions refer more particularly to northern Europe, but will be found of practical use to agriculturists generally. The work is divided into six sections; the first three deal with the temperature and the conductivity of the earth's surface, and at various depths, with different kinds of soil, with the formation of dew, and with evaporation, while the last three chapters deal with the phenomena of night frosts, the methods of their prediction, and a discussion of the various means which may be adopted to prevent or lessen their injury to vegetation. The chapter relating to the conditions under which frosts usually occur is instructive, and shows that they chiefly depend upon the tracks taken by barometric depressions, the positions of areas of high barometer, and on the amount of the radiation from the surface of the earth. The method sometimes adopted of predicting frost from the position of the dew-point in the evening is shown to be very unsafe, especially for ground temperatures. The protection caused by burning wet straw or moss, and so preventing radiation by means of smoke, is fully discussed; but the plan is not likely to come into general use, owing to the large area over which fires have to be lighted, and the probability of the smoke being drifted away by currents of air. The experiments have been made at a considerable cost of labour and money, part of the necessary funds having been contributed by the authorities of the University.

A PAPER on the "Geology of Torres Straits," from the combined points of view of Profs. A. C. Haddon, W. J. Sollas, F.R.S., and G. A. J. Cole, was read before the Royal Irish Academy two years ago, and has just been published in the Society's *Transactions* (vol. xxx. part XI.). This is the first time that any detailed description has been given of the islands between Queensland and New Guinea. One of the chief conclusions arrived at, from a close study, is that no recent movements of elevation of the shores of Torres Straits have taken place. "As our knowledge grows" (the authors state) "we the more distinctly see in Australia and its islands the ruins of a great southern continent, fractured and submerged, possibly during the great Alpine Himalayan revolutions, and now in process of resurgence, as the vast folds of the earth's crust roll slowly inwards upon the central continental mass."

A COPY of Dr. Sykes' report on the cause of the increase of mortality from diphtheria in London, prepared at the instance of the Health Department of the Vestry of St. Pancras, has been sent to us. Dr. Thorne Thorne, who has also drawn up a report on the same subject, concludes that increased school attendance has had a material influence in increasing the spread of diphtheria, and Dr. Sykes regards this conclusion as irresistible. Again, the increase in cases described as diphtheritic may be also due to variation in nomenclature, most forms of infectious sore-throat being now regarded as diphtheria, whereas formerly the term was restricted to typical cases. Dr. Sykes is, however, also of opinion that the variation in nomenclature may very possibly be due to a change of type in disease of the throat, brought about by increased density of population in our great towns, and the effects of increased personal infection consequent upon the greater aggregation in schools. But does this explain why London should be singled out from all our great cities for such a disastrous epidemic of diphtheria as has unfortunately prevailed over such a long and continuous period? Why should not these causes apply with equal force to Glasgow, Manchester, Birmingham, or any of our great centres of industry?

FRANK, and afterwards Schloesing and Laurent, showed that soil containing bacteria and algæ can fix free nitrogen in large quantities; their experiments, however, did not decide whether algæ alone are capable of doing this. In order to answer this question Kossowitsch has estimated (*Botanische Zeitung*, May 16, 1894) the amount of nitrogen present in a nutritive soil before and after the growth of pure cultures of two kinds of algæ, *Cystococcus* and *Stichococcus*. In neither case was any sensible increase of nitrogen detected; so that it appears that neither of these algæ alone have the power of fixing free nitrogen. *Cystococcus*, even when mixed with pure cultures of the bacteria which enable the Leguminosæ to assimilate free nitrogen, was found powerless in this direction; whereas a mixture of soil-bacteria and *Cystococcus*, which also contained a small amount of other algæ, had the power of fixing free nitrogen to a large extent. The same author also describes a number of experiments with heterogeneous mixtures of algæ and bacteria, and shows how in each case the capability of fixing free nitrogen is greatly increased by the addition of dextrose to the nutritive substratum. From this and also from the fact that such mixtures of algæ and bacteria which are capable of fixing free nitrogen when exposed to light cannot be shown to assimilate it in the dark, he concludes that although in no case has it been proved that algæ by themselves possess the power of fixing free nitrogen, yet they are in a symbiotic relationship with the nitrogen-fixing bacteria, and he regards it as probable that these latter draw on the assimilation-products of the algæ to supply the carbon they require in growth.

MR. BERNARD QUARITCH, Piccadilly, has issued a new list (No. 143) of the old and valuable books he has for sale. The list contains a number of rare books of travel, and many important works on botany, entomology, and ornithology.

MESSRS. HENRY SOTHERAN AND CO. will shortly issue a second and cheaper edition of Mr. J. G. Millais' "Game Birds, and Shooting Sketches," with illustrations by the author, and a frontispiece by Sir J. E. Millais, Bart.

WE have received a copy of "Bourne's Handy Assurance Manual" for 1894, now edited by Mr. William Schooling. The volume differs from its predecessors in several important respects, and some of the tables in it may be found useful to students of demography.

THE first volume of "The Royal Natural History," edited by Mr. Richard Lydekker, F.R.S., has been published by Messrs. Frederick Warne and Co. It is illustrated with numerous coloured plates and engravings, and forms a desirable addition to any library. We look forward with pleasure to the publication of the remaining volumes of Mr. Lydekker's important work, a work that possesses scientific interest and has a high educational value.

THE frontispiece of the July number of the *Monist* is a portrait of the late Dr. Romanes. Accompanying it and a short obituary notice, are two stanzas from a memorial poem addressed by the deceased investigator to Charles Darwin, and embodied in a volume printed for private circulation. The number also contains, among other matter, a paper entitled "The Non-Euclidean Geometry Inevitable," by Prof. G. B. Halsted; one on "Leonardo da Vinci as a Pioneer in Science," by Mr. W. R. Thayer; and another on "Monism in Arithmetic," by Prof. Hermann Schubert.

IN the *Journal of Botany* for July is "A Tentative List of British *Hieracia*," which affords a remarkable instance of the tendency to "splitting" displayed by botanists who devote themselves to monographing genera or families. Hooker's "Student's Flora" enumerates 10 British species of *Hieracium*, the eighth edition of Babington's "Manual" 33. The present list comprises no less than 103 specific names, besides varieties. Of these species 36 are attributed to two English botanists who have made the genus their special study, Mr. W. R. Linton and Mr. F. J. Hanbury.

AS in previous years, the *Photographic Annual* for 1894, edited by Mr. Henry Sturmey, contains a number of excellent pictures illustrating various systems of photographic and photo-mechanical reproduction. Some of these illustrations are extremely fine. We are specially interested in four figures reproduced from photographs of microscopic objects, obtained by Mr. Frederick Iles in a novel manner. By a method of stereoscopic illumination, not described, he has procured "stereo-micrographs" showing objects in beautiful relief, and which greatly disparage pictures obtained with ordinary illumination. Plant sections, medical sections, crystals, and other translucent objects are found by Mr. Iles to furnish good results. Judging from the photographs reproduced, the method may have important scientific applications. The text of the *Annual* includes records of the progress, during 1893, of photographic chemistry, by Mr. C. H. Bothamley; photographic optics, by Mr. Chapman Jones; and an admirable summary of work in astronomical photography, by Mr. Albert Taylor. The *Annual* also contains the usual complement of articles on practical photography, and information on recent novelties in photographic apparatus, appliances, and processes.

THE first edition of the late Sir Andrew Ramsay's well-known "Physical Geology and Geography of Great Britain" (Edward Stanford) appeared in 1863. Between then and 1878 five editions of the work were issued, and a sixth has just been published. This edition has been prepared by Mr. H. B. Woodward, and his "restoration" has been admirably done. It is a difficult task to enter thoroughly into the spirit in which an investigator like the late renowned geologist indites a book, but Mr. Woodward has allowed his personality to merge into that of the lamented author, and the result is that the work begins a new life in all its original freshness and vigour. More than thirty years ago, Sir Andrew delivered the lectures out of which the book has grown. The object of the course was "to show how simple the geological structure of Great Britain is in its larger features, and how easily that structure may be explained to, and understood by, persons who are not practised geologists." Some of the author's theoretical views have been called into question, but others have served to establish his perspicuity on geological matters. Throughout the book, however, controversial subjects are fairly treated in the light of latter-day evidence. The part in which the greatest changes have been necessary is that referring to Archæan rocks. Considerable changes had to be made in order to bring this section of the book into touch with current opinion. Not only have such necessary emendations been made, but most of the more or less uninteresting details inserted in the fifth edition have been omitted or condensed. Where the author's theories have been entirely controverted, the accepted views have been substituted for them, but opinions still *sub judice* have been left in their original form. Several changes have been made in the excellent little geological map which forms the frontispiece, especially in the northern part of Scotland. All the revision has been in the direction of improvement, and we have no doubt that numerous readers will appreciate the careful manner in which it has been done.

THE additions to the Zoological Society's Gardens during the past week include two Lesser White-nosed Monkeys (*Cercopithecus petaurista*, ♂ ♀), a Campbell's Monkey (*Cercopithecus campbelli*, ♀), a Brush-tailed Porcupine (*Atherura africana*) from West Africa, presented by Mr. W. H. Boyle; a Mona Monkey (*Cercopithecus mona*, ♂) from West Africa, presented by Mr. Charles Gardiner; two —— Tortoises (*Testudo*, sp. inc.) from the Aldabra Island, presented by Rear-Admiral W. R. Kennedy; a Crowned Lemur (*Lemur coronatus*, ♀) from Madagascar, deposited; an Eland (*Oreas canna*, ♂) from South Africa, a Livingston's Eland (*Oreas canna livingstonii*, ♀) from the Transvaal, two Short-toed Hedgehogs (*Erinaceus brachydactylus*) from Somaliland, purchased; a Thar (*Capra jemlaica*), a Japanese Deer (*Cervus sika*, ♀), a Wapiti Deer (*Cervus canadensis*, ♀), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

VARIATIONS OF LATITUDE.—Since 1885, the fifteen polar stars of which the apparent places are given in the *Connaissance des Temps*, have been regularly observed at Lyons Observatory. The materials thus obtained are used by M. F. Gonnessiat, in the *Bulletin Astronomique* (vol. xi. June and July 1894), for an investigation of the variations of latitude. The calculations show that from one maximum to the next the mean interval is 1·185 years; while the mean interval between